

(यह परीक्षण रिपोर्ट 30/04/2025 तक वैध है। / THIS TEST REPORT IS VALID UP TO : 30/04/2025)



## KAMCO, TeraTrac 4W TRACTOR



सत्यमेव जयते

भारत सरकार

कृषि एवं किसान कल्याण मंत्रालय  
कृषि, सहकारिता एवं किसान कल्याण विभाग  
मशीनीकरण एवं प्रौद्योगिकी प्रभाग

GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE AND FARMERS WELFARE

(Deptt. of Agricultural, Cooperation & Farmer's Welfare, Mechanization & Technology Division)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

ट्रैक्टर नगर, बुदनी (म.प्र.) ४६६ ४४५

**CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE**

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T-1434/1961/2020

KAMCO, TeraTRAC 4W TRACTOR – Commercial (1<sup>st</sup> Batch)

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**Manufacturer** : M/s. Kerala Agro Machinery Corporation Ltd.  
Athani P.O. District –Ernakulam,  
Kerala 683 585, INDIA

Test requested by : The manufacturer  
Selected for test by : Testing Authority  
Place of running-in : At manufacturer's works  
Duration of said running-in, (h):  
- Engine : 100  
- Transmission : 20  
**Method of Selection** : The test sample was selected randomly out of Five tractors from the production line by the representative of testing authority.

Tractors made available for random selection :

Sr. No.	Chassis serial number
i)	5618090006
ii)	5618090008
iii)	5618090007
iv)	5618090004
v)	5618090005

## 1. SPECIFICATIONS

- 1.1 Tractor:**  
Make : KAMCO  
Model : TeraTRAC 4W  
Brand name : KAMCO  
Variant, if any : None  
Type : Four wheel, Four wheel driven, unit construction, general purpose, Agricultural Tractor  
Month & year of manufacture : 09 /18  
Chassis number : 5618090004  
Country of origin : India
- 1.2 Engine:**  
Make : Kohler  
Model : KDW 702  
Type : Four stroke, liquid cooled, naturally aspirated, In-direct injection, diesel engine.  
Serial number : 4821200056  
Country of origin : India
- 1.2.1 Engine speed (rpm), (Manufacturer's recommended production settings):**  
- Maximum speed at no load : 3350 to 3550  
- Low idle speed : 1000 to 1200  
- Speed at maximum torque : 2000 to 2400  
**Rated speed, (rpm):**  
- For PTO use : 3200  
- For drawbar use : 3200



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	Previous Sample	Present Sample
	iii) The maximum drop of 63 mm was observed during lift load maintenance test against the maximum preferable limit of 50 mm. This calls for suitable improvement in the system.	--
<b>13.5 Adequacy of literature:</b>	Following literatures has been supplied with the tractor for reference during the test. a) User Manual (Kamco Tractor Tera TRAC 4W) b) Spare part's catalogue (Kamco Tractor) c) Workshop manual for Engine (For Focs series engine ,code 1-5302-351)	Following literatures has been supplied with the tractor for reference during the test. a) User Manual (Kamco Tractor Tera TRAC 4W) b) Spare part's catalogue (Kamco Tractor) c) Workshop manual for Engine (For Focs series engine ,code 1-5302-351)

#### 14. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

- 14.1** On the basis of tests conducted the performance results have been summarized as evaluative (mandatory) and non-evaluative (not-mandatory) parameter applicable for qualifying Minimum Performance Criteria as per Clause-4 (Table-1) of IS: 12207-2019 for acceptance of the tractor for the purpose of subsidies/NABARD financing are summarized as under:-

Sl. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2019	Values declared by the applicant/ (D) Requirement (R)	As observed	Whether meets the requirements (Yes/No)
1	2	3	4	5	6	7
<b>14.1.1</b>	<b>PTO Performance :</b>					
a)	Maximum power under 2 h test, (kW ) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: $\pm 5\%$ for PTO power and or engine power $> 26$ kW. $\pm 10\%$ for PTO power and or engine $\leq 26$ kW.	10.0 (D)	9.0	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	10.0 (D)	9.0	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	+ 10% max.	385 (D)	424	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	$\pm 8\%$	32.3 (D)	32.2	Yes
e)	Back-up torque, percent	Evaluative	12 percent	12.0 % (D)	20.1	Yes



1	2	3	4	5	6	7
f)	Maximum operating temperature, ( $^{\circ}$ C)					
1)	Engine oil	Evaluative	The declared value should not exceed the max. value specified by the oil company and the observed value under high ambient condition should not exceed the declaration.	130 (D)	114	Yes
2)	Coolant	Evaluative	The declared value should not exceed the boiling temperature of coolant under the pressurized or otherwise and the observed value under high ambient condition should not exceed the declaration.	110 (D)	98	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. power under High ambient conditions.	4.45 Maximum (R)	2.14	Yes
h)	Smoke level, $m^{-1}$	Evaluative	Maximum light absorption coefficient of 3.25 per meter or equivalent BOSCH No. 5.2 or 75 Hatridge value (As per CMVR).	3.25 Maximum (R)	1.32	Yes
<b>14.1.2</b>	<b>Drawbar performance :</b>					
a)	Max. drawbar pull with ballasted corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 70% of static mass of tractor with ballast.	4.4 (D) 5.25 Minimum (R)	6.72	Yes
b)	Max. drawbar pull with standard ballasted as the case may be corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 70% of static mass of tractor without ballast or with standard ballast, as the case may be.	4.67 (D) 4.67 (R) Minimum	6.02	Yes
c)	Maximum drawbar power with standard ballast, (kW).	Evaluative	Minimum 80 % of PTO power as referred in SI No. i) a) of PTO performance in case of tractors having total static mass > 1500 kg Minimum 75 % of PTO power as referred in SI No. i) a) of PTO performance in case of light weight tractors having $\leq$ 1500 kg total static mass of tractor Minimum 75 % of the engine power as referred in SI No. i) a) of engine performance in case of tractors which do not have a PTO shaft.	8.0 (D) 6.75 (R) Minimum	7.4	Yes
d)	Maximum transmission oil temperature ( $^{\circ}$ C)	Evaluative	The declared value should not exceed the maximum value specified by oil company	90 (D)	77	Yes



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1	2	3	4	5	6	7	
<b>14.1.3</b>	<b>Power lift and hydraulic pump performance :</b>						
<b>a)</b>	Maximum lifting capacity throughout the range of lift, (kN):						
	1)	At hitch points	Evaluative	Tolerance of $\pm 10\%$	2.75 (D)	2.85	Yes
	2)	With the standard frame	Evaluative	The lift capacity should at least be 24 kg/PTO kW, and it should be 21.5 kg/engine kW where the tractor is not provided with a PTO shaft.	2.4 (D) 2.12 (R) Minimum	2.56	Yes
<b>b)</b>	Maximum drop in the height of the point of application of the force after each 5 minutes interval for a total duration of 30 Minutes, (mm)		Non Evaluative	The observed value should not exceed 50 mm	50 (D) Maximum	40	Yes
<b>14.1.4</b>	<b>Brake performance at 25 kmph:</b>						
<b>a)</b>	Maximum stopping distance at a force, equal to or less than 600 N on brake pedal with road ballast, (m):						
	1)	Cold brake	Evaluative	10	10 (R)	2.25	Yes
	2)	Hot brake	Evaluative	10	10 (R)	2.27	Yes
<b>b)</b>	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s <sup>2</sup> (N)		Evaluative	600	600 (R) Maximum	250 to 285	Yes
<b>c)</b>	Whether parking brake is effective at a force of 600 N at foot pedal (s) or 400 N at hand lever, N		Evaluative	Yes / No	Yes	434	Yes
<b>14.1.5</b>	<b>Noise measurement :</b>						
<b>a)</b>	Maximum ambient noise emitted by the tractor dB(A)		Evaluative	88 dB(A) for >1.5 tonne GVW and 85 dB(A) for $\leq 1.5$ tonne GVW (as per CMVR)	85 (R)	79	Yes
<b>b)</b>	Maximum noise at operator's ear level dB(A)		Evaluative	As per CMVR	96 (R)	90	Yes
<b>14.1.6</b>	<b>Amplitude of mechanical vibrations at:</b>						
	1)	Left foot rest	Non Evaluative	100 microns (max)	100(R)	97	Yes
	2)	Right foot rest				94	Yes
	3)	Seat (with driver seated)				74	Yes
	4)	Steering wheel				227	No



1	2	3	4	5	6	7
<b>14.1.7</b>	<b>Air cleaner oil pull over:</b>					
	Maximum air cleaner oil pull over, (%)	Evaluative	0.25 % Maximum	0.25 % Maximum	Dry type air cleaner is provided	Not applicable
<b>14.1.8</b>	<b>Haulage requirements :</b>					
<b>a)</b>	Gross mass of the trailers, (tones):					
	Two wheel	Non Evaluative	--	1.0 (D)	1.0	Yes
<b>b)</b>	Distance travelled / liter of fuel consumption, (km/l):					
	Two wheel	Non Evaluative	--	11.4 (D)	7.19 to 7.59	No
<b>c)</b>	Fuel consumption (ml/km/tonne):					
	Two wheel	Non Evaluative	--	90.0 (D)	131.8 to 139.0	No
<b>14.1.9</b>	<b>Wetland cultivation :</b>					
	Sealing for the following assemblies:	Evaluative	The identified assemblies should essentially meet the requirement of IS: 11082. No water ingress in the identified assembly given in column-2. If tractor does not meet the requirements of wetland cultivation, it may be recommended for dry land operation only.	There should be no ingress of water and/or mud (R)	The major breakdowns were not observed in the field test during initial commercial testing of the tractor model having test report No. T-875/1389 /2013 (May, 2013)	Yes
1)	Clutch assembly	-do-				
2)	Brake housings	-do-				
3)	Front axle hubs	-do-				
4)	Engine Oil	-do-				
5)	Transmission Oil	-do-				
<b>14.1.1</b>	<b>Safety features :</b>					
<b>a)</b>	Guards against moving and hot parts	Evaluative	Belt drives, pulleys, silencer, hydraulic pipes (As per IS 12239 (Part2)		Meets the requirement	Yes
<b>b)</b>	Lighting arrangement	Evaluative	As per CMVR		Meets the requirement	Yes
<b>c)</b>	Seating requirements (Tractors having more than 1150 mm rear track width)	Non Evaluative	Should meet the requirements of IS: 12343 (As amended from time to time)		Not applicable	Not applicable
<b>d)</b>	Technical requirements for PTO shaft	Evaluative	Should meet the requirements of IS: 4931 (As amended from time to time)		Meets the requirement	Yes
<b>e)</b>	Dimensions of three point linkage	Non Evaluative	Should meet the requirements of IS: 4468 (Part-I) (As amended from time to time)		<b>Does not meet the requirement</b>	<b>No</b>
<b>f)</b>	Specifications of linkage drawbar	Evaluative	Should meet the requirements of IS: 12953 (As amended from time to time)		Meets the requirement	Yes
<b>g)</b>	Swinging drawbar (wherever fitted)	Evaluative	Should meet the requirement of IS: 12362 (Part 3) (As amended from time to time)		Not Provided	Not applicable



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1	2	3	4	5	6	7		
h)	1)	Maximum travelling speed at rated engine speed in reverse gears, Kmph	Evaluative	Should not exceed 20 Kmph		14.96 kmph (Meets the requirement)	Yes	
	2)	Audible warning signal on tractor	Evaluative	As soon as the travelling speed in reverse gear reaches to 20 kmph, an audible warning signal on tractor shall be activated. The safety aspects about the operation of shuttle technology shall be brought in operation and manufacturer /dealer shall ensure the training on this aspect to operator before the delivery of tractor.		Not fitted	Not applicable	
14.1.11	<b>Labelling of tractors (Provision of labelling plate):</b>							
	1)	Make	Evaluative	Should conform to the requirements of CMVR along with maximum PTO Power in kW and year of manufacture in numerical form. <table border="1" style="margin-left: 20px;"> <tr> <td>MM</td> <td>YY</td> </tr> </table> Digit 01 – 12 in box No.1 for MM will represent the months and next two digits in box No.2 for YY will represent the year of Manufacturing.	MM	YY	KAMCO	Yes
MM	YY							
	2)	Model	Evaluative		TeraTRAC	Yes		
	3)	Month & Year of manufacture	Evaluative		09 / 18	Yes		
	4)	Engine number	Evaluative		4821200056	Yes		
	5)	Chassis number	Evaluative		5618090004	Yes		
	6)	Maximum PTO power, (kW)	Evaluative	10	Yes			
14.1.12	<b>Discard limit for:</b>							
(a)	Cylinder bore diameter, (mm)		Evaluative	To specified by the manufacturer and supported by the printed literature	75.06 (D)	75.01	Yes	
(b)	Clearance between piston & cylinder liner at skirt, (mm)		Non Evaluative		0.170 (D)	0.060 to 0.085	Yes	
(c)	Piston diameter at skirt, (mm)		Non Evaluative		74.89 (D)	74.925 to 74.950	Yes	
d)	<b>Ring end gap (mm):</b>							
	-	Top comp. ring.	Evaluative	-do-	1.0 (D)	0.45 to 0.50	Yes	
	-	2 <sup>nd</sup> comp. ring.		-do-	1.0 (D)	0.35 to 0.40	Yes	
-	Oil ring.	-do-		1.0 (D)	0.45	Yes		
e)	<b>Ring groove clearance (mm):</b>							
	-	Top comp. ring.	Evaluative	-do-	0.30 (D)	0.90	Yes	
	-	2 <sup>nd</sup> comp. ring.		-do-	0.30 (D)	0.055 to 0.068	Yes	
-	Oil ring.	-do-		0.30 (D)	0.049 to 0.050	Yes		
f)	<b>Clearance of main bearings (mm):</b>							
	-	Diametrical clearance	Evaluative	-do-	0.198 (D)	0.035 to 0.107	Yes	
-	Crankshaft end float	Evaluative	0.60 (D)		0.15	Yes		
g)	<b>Clearance of big end bearings, (mm):</b>							
	-	Diametrical	Evaluative	-do-	0.21 (D)	0.048 to 0.104	Yes	
	-	Axial	Evaluative	-do-	2.70 (D)	1.95	Yes	
(h)	Clearance between king pin and bush, (mm)		Non Evaluative	-do-	0.50 (D)	0.03 to 0.06	Yes	
(i)	Clearance between centre pin and bush, (mm)		Non Evaluative	-do-	0.50 (D)	0.11 to 0.19	Yes	

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1	2	3	4	5	6	7
<b>14.1.13</b>	<b>Literature (Submission to test agency)</b>					
(a)	Operator manual	Evaluative	Provided / Not Provided	Provided	Provided	Yes
(b)	Parts Catalogue	Evaluative	Provided / Not Provided	Provided	Provided	Yes
(c)	Workshop/ Service manual	Evaluative	Provided / Not Provided	Provided	Provided	Yes
<b>14.1.14</b>	<b>Fitment of Roll Over Protective Structures (ROPS):</b>					
	For tractor having more than 1150 mm rear track width	Evaluative	ROPS should meet the requirement of IS:1182 or OECD code or equivalent International Standard		Not Applicable	Not applicable
<b>14.1.15</b>	Standard Accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with tractor		Provided	Yes
<b>14.1.16</b>	Accessories (optional)	Non Evaluative	Ballast weight, if fitted, should meet the requirement of CMVR		Provided	Yes

<b>14.2 CATEGORY OF BREAKDOWNS / DEFECTS ( As per clause 5.0 of IS:12207-2019):</b>					
Sl. No.	Category of breakdowns	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2019	As observed	Whether meets the Requirements (Yes/No.)
1.	Critical	Evaluative	No critical breakdown	None	Yes
2.	Major	Evaluative	Not more than one and neither of them should be repetitive in nature	None	Yes
3.	Minor	Evaluative	Not more than three and frequency of each should not be more than two.	<b>One (Mn-17)</b>	Yes
4.	Total breakdowns	Evaluative	In no case, the total number of breakdowns should exceed four, that is, (1 major + 3 minor) or 4 minor breakdowns.	<b>One (Mn-17)</b>	Yes

**14.3 Salient Observations:**

**14.3.1 Laboratory tests:**

**14.3.1.1 PTO Performance Test:**

- i) The maximum PTO power was observed as **9.0 kW** against the declaration of **10.0 kW**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- ii) The specific fuel consumption corresponding to maximum power was recorded as **424 g/kWh** against the declaration of **385 g/kWh**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- iii) The maximum equivalent crankshaft torque was recorded as **32.2 N-m** against the declaration of **32.3 N-m**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- iv) The backup torque is **20.1 %**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- v) Drop in max. PTO power of **7.8 %** in high ambient condition as compare to natural ambient condition which was considered on higher side.





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- vi) During PTO performance test, the electrical wire between battery and alternator was got burned and replaced with new one of same specifications

**14.3.1.2 Drawbar performance test:**

During ten hour drawbar performance test, creeping of RHS rear tyre over the rims was recorded as **5 mm**. This should be looked into for necessary corrective action.

**14.3.1.3 Hydraulic performance test**

During lift capacity at hitch point of hydraulic performance test, oil seal (Part No. 9245018) between camshaft and hydraulic pump was got damaged. Same was replaced with new one of same specification. This breakdown has been categorized under **Mn-17** as per IS:12207-2019. This should be looked into for necessary corrective action at production level.

**14.3.1.4 Mechanical Vibration:**

The amplitude of mechanical vibration on various assemblies marked as (\*) in Chapter – 8 of this test report is on higher side. This calls for dampening down of vibrations especially on steering control wheel to improve the operational comfort and service life of components.

**14.3.1.5 Three point linkage:**

The dimension "Transport height" does not meet the requirement of IS: 4468 (Part I) – 1997 (Reaffirmed in Oct, 2017). This is recommended to look into for necessary corrective action.

**14.3.1.6 Haulage test**

i) Distance travelled / liter of fuel consumption was recorded as **7.19 to 7.59 km/l** against the declaration of **11.4 km/l**, which does not meet the requirement of IS:12207-2019 with regards to tolerance limit. This is recommended to look into for necessary corrective action.

ii) Fuel consumption (ml/km/tonne) was recorded as **131.8 to 139.0 ml/km/tonne** against the declaration of **90.0 ml/km/tonne**, which does not meet the requirement of IS:12207-2019 with regards to tolerance limit. This is recommended to look into for necessary corrective action.

**14.4 Maintenance / Service Problems:**

No noticeable maintenance or service problem was observed during the test.

**14.5 Recommendation with regard to safety on tractor:**

The following requirements, inter alia, may be considered for incorporation on the tractor:

- i) Width of operator's seat should be as per relevant IS code.
- ii) Longitudinal distance from SIP to center line of differential lock pedal & steering control wheel should be as per the requirement of relevant IS code.
- iii) Hand holds should be provided for easy mounting and dismounting of operator.
- iv) Vertical retainness should be provided at both side of clutch & brake pedal.
- v) Anti slip surface for floor area and drainage should be provided.
- vi) Master shield & PTO shaft cover should be provided.
- vii) There should be provision for spark arresting device in exhaust system.

**14.6 Adequacy of Literature supplied with machine:**

**14.6.1** The supplied literature was found adequate

- a) User Manual (Kamco Tractor Tera TRAC 4W)
- b) Spare part's catalogue (Kamco Tractor)
- c) Workshop manual for Engine (For Focs series engine ,code 1-5302-351)

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- 14.6.2 However, these literatures should be brought out in other vernacular languages of India for guidance of users

### 15. Citizen charter

Test duration under citizen charter	Duration of Test	Whether the report released within time frame given in the citizen charter	Remark
10 Months	04 Months (January, 2020 to April, 2020)	Yes	None

#### TESTING AUTHORITY:

**RAJNEESH PATEL**  
AGRICULTURAL ENGINEER

**C.V. CHIMOTE**  
TEST ENGINEER

**J.J.R. NARWARE**  
DIRECTOR

The report compiled by: **Sh. Shivkumar Sharma**, Senior Technical Assistant.

### 16. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's comments
16.1	14.3.1.1 (v) & (vi)	The case will be studied and suitable measures will be taken.
16.2	14.3.1.2	Will take necessary corrective action.
16.3	14.3.1.3	Necessary action will be taken for improvement
16.4	14.3.1.4	Action will be taken to reduce the vibrations to minimum level.
16.5	14.3.1.5 & 14.3.1.6 (i) & (ii)	Suitable corrections will be taken
16.6	14.5	Will take necessary corrective action.



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**ANNEXURE- I****TRACTOR RUN HOURS DURING TEST**

<b>A.</b>	<b>LABORATORY AND TRACK TESTS</b>	<b>HOURS</b>
1.	Running-in	120
2.	PTO performance test	13.6
3.	Drawbar performance test	14.9
4.	Power lift and hydraulic pump performance test	1.3
5.	Brake test	2.0
6.	Noise measurement	1.0
7.	Mechanical vibration test	1.0
8.	Nominal speed test	0.5
<b>B.</b>	<b>HAULAGE TEST</b>	<b>11.4</b>
<b>C.</b>	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	6.4
<b>TOTAL:</b>		<b>172.1</b>